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These tickets give the right to go from the frontier to the starting places of the excursions (St. Petersburg, Moscow, etc.), and to take part in all the parts of the proposed itinerary.

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Persons who do not make use of the railway ticket sent them, are requested to return it to the committee by registered letter.

To the persons arriving by Finland, the tickets for transportation on the Finnish railways will be delivered by Mr. I. Sedorholm, Director of the Geological Survey of Finland, and member of the Committee of organization.

In the name of the general committee of organization.

THE BUREAU.

A. KARPINSKY, *President.*

TH. TSCHERNISCHEW, *General Secretary.*

RECENT LITERATURE.

A Text-Book of Experimental Embryology.¹—Professor Morgan, of Bryn Mawr College, has made the first attempt to bring the results of the labors of German and American experimental embryologists into such form as may serve as an introduction to this rapidly growing branch of biology. The scattered and too often inaccessible

¹ The Development of the Frog's Egg. An Introduction to Experimental Embryology, by Thomas Hunt Morgan. The MacMillan Co., New York, 1897, pps. 186, 51 figs. in text. Price, \$1.60.

notes and papers put forth by the enthusiasm of workers in this field are here brought to the hands of the student in a form at once intelligible and available; grouped about a concrete case, the development of a well known animal, the frog. But the book is less a compilation than the entire statement of the author's own researches on this subject complimented and illuminated by facts taken from other authors, having a direct bearing upon the frog's development, though sometimes going into wider fields for more definite illustration. It is an account of the development of the frog as seen from the point of view of the experimental embryologist, who desires to understand as well as to record his facts, and seeks information by direct, more or less pertinent, questions put to nature in the form of experiments. With the exception of certain treatises upon comparative embryology, we may regard this as the first attempt at a truly scientific text-book of embryology—as something more than a history of developmental stages—and it is noteworthy that America and not Germany has produced this as well as the two other important biological text-books recently issued by the same publishers.

The book will serve as a useful manual for advanced students and welcome reading for the many biologists who have not the time for direct study in this special field. How far it may lead to the gradual substitution of the life history of the physiologist's pet, the frog, in place of the development of the ever accessible chick in elementary biological instruction remains for time to show.

A brief summary of the leading chapters may convey some idea of the ground covered and the treatment of the subject. The first deals with the making of the egg and sperm, and is largely a compilation with free use of phenomena better known in other animals. The second describes the formation of the polar bodies and the process of fertilization. The third briefly reviews experiments upon cross-fertilization in frogs of different species. The fourth treats of cleavage and shows the author's special intimacy with this phase of the subject; there is not only a detailed description with excellent original figures, but also a most interesting comparison of the arrangements of cells in the cleaving of frog's eggs with possible combinations of oil drops as arranged in Roux's experiments. The author says: "It seems highly probable that surface tension is also an important factor in the segmenting egg, but other conditions present prevent its free play."

The fifth and sixth take up in detail the formation of the blastopore and the associated phenomena of concrescence and germ-layer formation; intricate problems clearly elucidated in the frog's case by aid of

the author's own research. Additional evidence is presented in the next chapter which considers the abnormal embryos made in salt solutions in the experiments of Hertwig and of Morgan.

Two chapters discuss the effects of gravitation acting upon cleaving frog's eggs; first in the series of experiments of Pflüger and then in those of Born and of Roux. The tenth takes up the cleavage of eggs under pressure and concludes that in early cleavage the *nuclei are all equivalent*. The next throws additional light upon the nature of cleavage in presenting the work of Roux, Morgan and others, who have reared larvæ from eggs in which one of the first two cells has been injured. The intricacies of "post generation" are also set forth here.

The interpretations and conclusions of the twelfth chapter conclude that part of the volume dealing with experimental work, save that a short sixteenth chapter briefly gives the effect upon frog's eggs of light and of temperature.

Two added chapters continue the account of the frog's growth, and describe the formation of mesodermal and of entodermal organs, so that the book may serve as a substitute for Marshall's text-book, besides being an introduction to a new method of study.

In the twelfth chapter we find a very clear statement of Roux's mosaic theory and its modifications, a brief account of the conceptions of Driesch and of Hertwig, and the remarkable facts observed upon the Ctenophore egg. From experiments upon these eggs the author concludes that "in the protoplasm and not in the nucleus lies the differentiating power of the early stages of development."

The Roux-Weismann hypothesis of *qualitative* nuclear division is rejected as having "no known histological facts in its favor."

To reconcile the prevailing conception of the power of the nucleus with the idea that the differentiating power resides in the egg protoplasm outside the nucleus, the author suggests that the nucleus participates in determining form only so far as it controls the special character of an organ, while the main determination as to what part shall be one organ rather than another, is made by the non-nuclear part of the egg or cell. "After cleavage, the cytoplasm of each part differentiates into this or that organ, but the kind of differentiation of each part is determined by the nucleus of that part."

Touching the fundamental question as to the cause of differentiation the author says: "Driesch has pointed out that the egg seems to act like an intelligent being." If so, are the causes of differentiation and of regeneration the same in kind as physico-chemical causes, or do they belong to the category of intelligent acts, and can these latter be ac-

counted for by *known* principles of chemistry and physics? The plain answer is, we do not know.—E. A. A.

Miocene Mollusca and Crustacea of New Jersey.²—This important work is published in the Monograph (Vol. XXIV) Series of the U. S. Geological Survey. Very little attention had been given to the Miocene molluscan fauna of New Jersey when Mr. Whitfield began a systematic study of it. A list published by Mr. F. B. Meek, a few species described by different writers, and the work done by Prof. Heilprin summarizes all the knowledge concerning this fauna up to 1887. The present work is based on the collections in the U. S. National Museum and the Philadelphia Academy of Natural Sciences. One hundred and four species are recognized and described, which, with the four species given in Prof. Heilprin's list and two species of Bryozoans in Meek's list would carry the number to one hundred and ten species. The species described are distributed as follows: Brachiopoda 1, Lamellibranchiata 61, Gasteropoda 39, Crustacea 1. All the species are figured on 24 page-plates.

Sixteenth Annual Report U. S. Geological Survey, Parts III and IV.³—This report forms the eleventh in the series Mineral Resources of the United States. Part III treats of metallic products containing the usual summary of recent developments in the knowledge of the mineral deposits, the amount produced, its value, etc. in this country, etc. and also in other countries which trade with the United States. Part IV embodies the latest information concerning the non-metallic products. The illustrations consist of maps, diagrams and figures in the text.

We are informed that the cost of printing and binding is no longer charged for this book, and that by making prompt application to a Senator or Representative the volume may be obtained, as the Congressional distribution of the book will soon ensue.

Glaciers of North America.⁴—In an octavo volume of some 210 pages Mr. Russell has condensed the existing knowledge of North

² Monographs of the U. S. Geological Survey. Vol. XXIV. Miocene Mollusca and Crustacea of New Jersey. By R. P. Whitfield. Washington, 1894.

³ Sixteenth Annual Report of the United States Geological Survey. Part III, Mineral Resources of the United States, 1894, Metallic Products. Part IV Non-metallic Products. Washington, 1895.

⁴ Glaciers of North America. By I. C. Russell. Boston and London, 1897. Ginn and Co., Pub.